

Date: Tuesday, 1/9/2007 4:07:40 PM
 Per: Kim Johnston

Process Sheet

Customer : CU-DAR001 Dart Helicopters Services	Drawing Name : OH-58 FWD X-TUBE ASSEMBLY - UNDER REVIEW
Job Number : 30219	
Estimate Number : 12526	
P.O. Number : N/A	Part Number : D058676101
This Issue : 1/9/2007	Drawing Number : D058-676-141 REV A2
Prsht Rev. : NC	Project Number : N/A
First Issue : N/A	Drawing Revision : A2 UNDER REVIEW
Previous Run : 30218	Material : N/A
	Due Date : 2/10/2007
Written By : <u>JA 07.01.09</u>	Qty: 1 Um: Each
Checked & Approved By : <u>JA 07.01.09</u>	
Comment : Est Rev: E 06.09.11 Reformat IEC	

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
----------------	------------------------------	----------------------

1.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D058-676-101CHG001

2.0

D6001105

Crosstube



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6001-105 Crosstube B23965

MS 07/01/11

3.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand & install plugs on both ends as per Folio FA085

2-Turn first side as per Folio FA085

3-Deburr & Inspect for surface damage.

MS 07/01/11

4.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

MS 07/01/11

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 1/9/2007 4:07:40 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: OH-58 FWD X-TUBE ASSEMBLY - UNDER REVIEW

Job Number: 30219

Part Number: D058676101

Job Number:



Seq. #:	Machine Or Operation:	Description :
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5.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA085

2-Deburr & Inspect for surface damage.

MS 07/01/12

6.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

MS 07/01/12

7.0

QC8

SECOND CHECK



Comment: SECOND CHECK

En 07/01/15 (X1)

8.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Remove sand and plugs

2-Scribe part # and batch # using vibrating stylus as per Dwg D058-676-141
Inside of Cuff(Donot engrave on outside of tube)

RG 07.01.15

9.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

Pm 750 7-1-22 (1)

10.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

DP 7-1-22

11.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

Pm 750 7-1-22 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng./ Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: OH-58 FWD X-TUBE ASSEMBLY - UNDER REVIEW

Job Number: 30219

Part Number: D058676101

Job Number:



Seq. #: Machine Or Operation: Description :

12.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

DP 2-1-25

13.0 BENDING BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D058-676-141 using CNC bender program OH58-fw and Folio FT014

DP 2-1-25

14.0 QC6 DIMENSIONAL CHECK



Comment: Inspect dimensions and work To Current Step

07 02-05

15.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube as per Dwg D058-676-141 using drill Jig DT8541 & DT8542

2-Ream hole to finish size in tube as per Dwg D058-676-141 using drill Jig DT8541 & DT8542. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D058-676-141

RT 07-02-27
DP

16.0 HAND FINISHING1 HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

DP 507-2-27

17.0 QC3 INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

07/03/01

18.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

07-03-09
LPI

19.0 OUTSIDE SERVICE OUTSIDE SERVICES



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 0380

Issue P/O: 3270

LL 07-03-09

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: OH-58 FWD X-TUBE ASSEMBLY - UNDER REVIEW

Job Number: 30219

Part Number: D058676101

Job Number:



Seq. #:

Machine Or Operation:

Description :

LPI as per ASTM 1417 Level 2

Attach copy of NDT results to work order

20.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage Ensure copy of NDT results attached to work order.

JP 07/03/19

21.0

QC6

DIMENSIONAL CHECK



Comment: Inspect for damage & ensure results are as per Dwg D058-676-241

JP 07/03/19

22.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

JP 07/03/19

①

2-Paint outside crosstube with White Imron as per QSI 005 4.2

JP 07/03/19

①

23.0

QC14

Inspect Spray Paint



Comment: Inspect Spray Paint

Then, Wrap in plastic bag to protect from scratches

JP 07/03/19

24.0

D2856400

Abrasion Strip



Comment: Qty.: 0.5800 f(s)/Unit Total : 0.5800 f(s)

Pick:

Qty Part number

Description

Batch

2 D2856-400-694 Abrasion Strip

29850

JP 07-03-21

25.0

D28911

Support 2.25 dia



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description

Batch

2 D2891-1

Support *29086*

JP 07-03-21

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: OH-58 FWD X-TUBE ASSEMBLY - UNDER REVIEW

Job Number: 30219

Part Number: D058676101

Job Number:



Seq. #: Machine Or Operation: Description :

26.0 MS2192020 Clamp (per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number

Description Batch

4 MS21920-20

Clamp

102440

RT 07-03-21

27.0 LANDING GEAR 1 LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8579

2-Install supports and clamps as per Dwg D058-676-141. Torque clamps to 80-100 in lb.

} RT 07-03-21

28.0 QC5 INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

RT 07-03-21

29.0 PACKAGING 1 PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

30.0 AN532A Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

4 AN5-32A

Bolt

M103338 ✓

31.0 AN960JD516 Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

8 AN960JD516

Washer

M102515 ✓

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☐ No ☒ DQA: ☒ Date: 09/08/03
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Tuesday, 1/9/2007 4:07:41 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: OH-58 FWD X-TUBE ASSEMBLY - UNDER REVIEW

Job Number: 30219

Part Number: D058676101

Job Number:



Seq. #:

Machine Or Operation:

Description :

32.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick: Packing Kit

Qty Part number

4 MS21042L5

Description Batch

Nut (or -5)

M100564

Cc 7/3/22 ①

33.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

34.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D058 676-101

Location:

REV'D 07/03/22 SD

35.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

07/03/23 ①

Job Completion



U 07-03-23

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>#</i>	APPROVED <i>#</i>	DRAWING NO. D058-676-141	REV. A SHEET 1 OF 3
DATE 00.11.17		TITLE CROSSTUBE ASS'Y (OH-58 HIGH FWD) NTS	
A	00.11.17	NEW ISSUE	

Qty	Part Number	Description
X	D058-676-141	CROSSTUBE ASSEMBLY (OH-58 HIGH FWD)
1	D6001-105	CROSSTUBE
2	D2856-400-694	ABRASION STRIP
2	D2891-1	SUPPORT
4	MS21920-20	CLAMP

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6001-105
FINISHED LENGTH = 103.03±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-400-694 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2891-1 SUPPORT, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) SEAL EDGES OF SUPPORTS AND ABRASION STRIP USING SIKAFLEX-241/291 SEALANT.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

UNDER REVIEW

06.10.18 PH
update view 0.0
07.01.09
PH

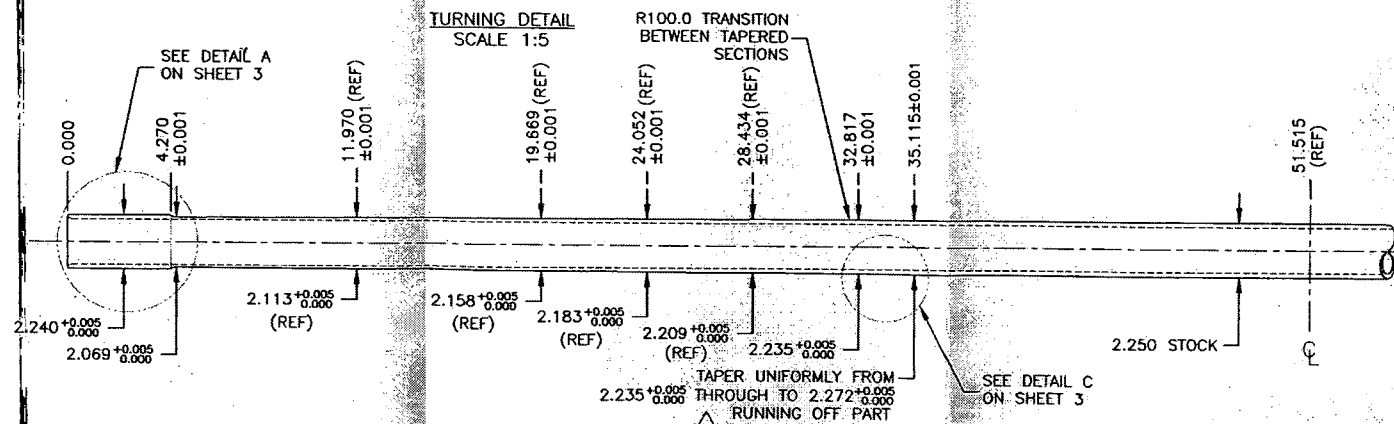
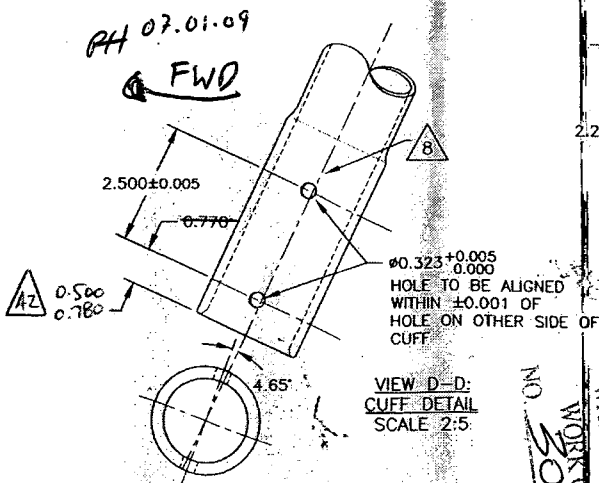
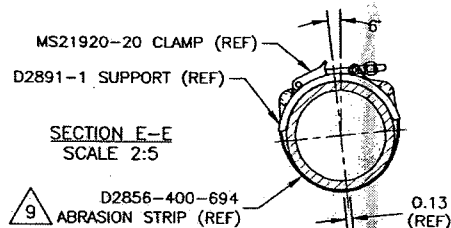
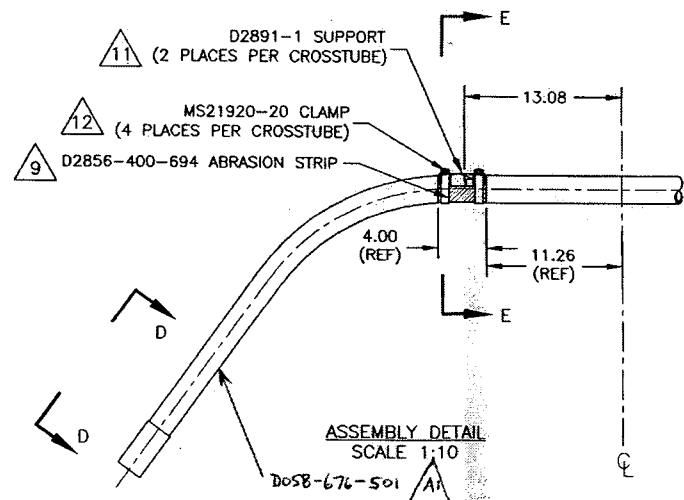
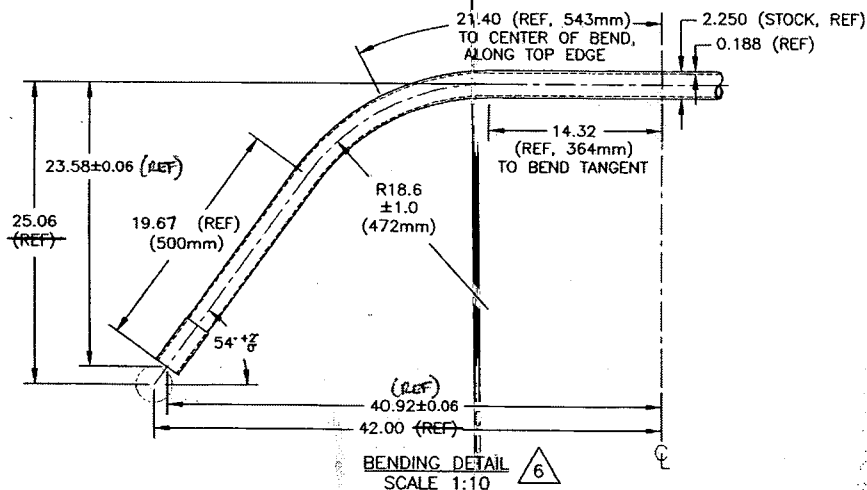
SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. *30219*

RELEASED
00.11.24 #

A2	01.07.16	UPDATE DIM TO FIRST HOLE	<i># CP</i>
A1	01.03.07	ADD D058-676-501 P/N	<i># CP</i>

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UNDER REVIEW

06.10.04
Update View D-D

07.01.09
RH

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ENGINEERING
SUBJECT TO AMENDMENT
WITHOUT NOTICE

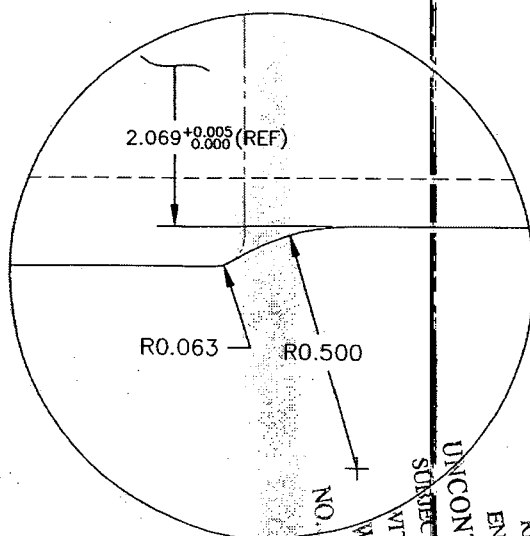
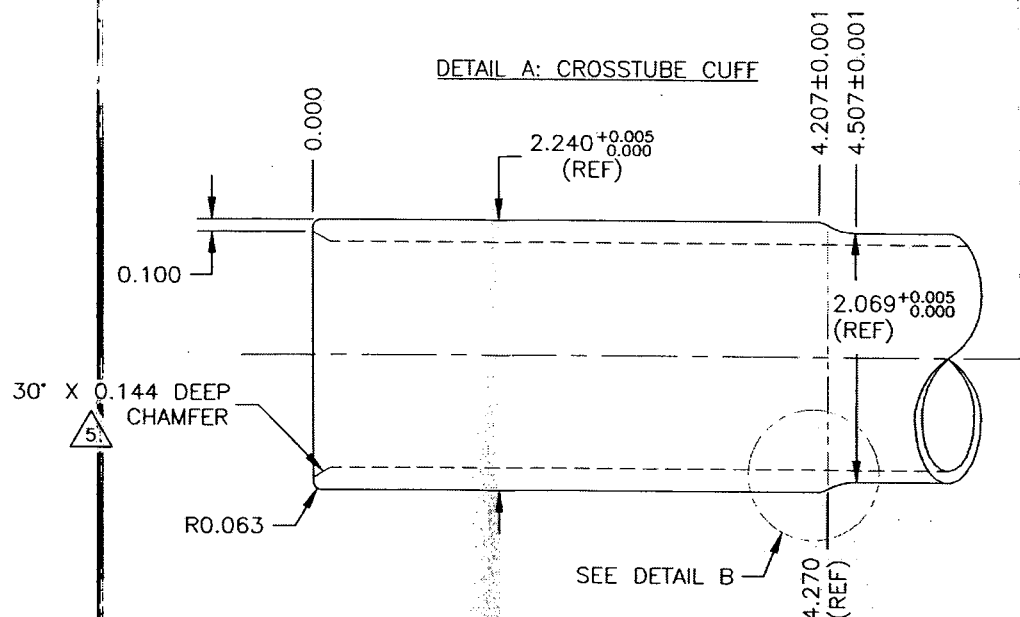
NO. 30219

RELEASED
00.11.24

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		DATE		DRAWING NO.	REV. A
		00.11.17		D058-676-141	SHEET 2 OF 3
				TITLE	SCALE
				CROSSTUBE ASSEMBLY (OH-58 HIGH FWD)	1:10

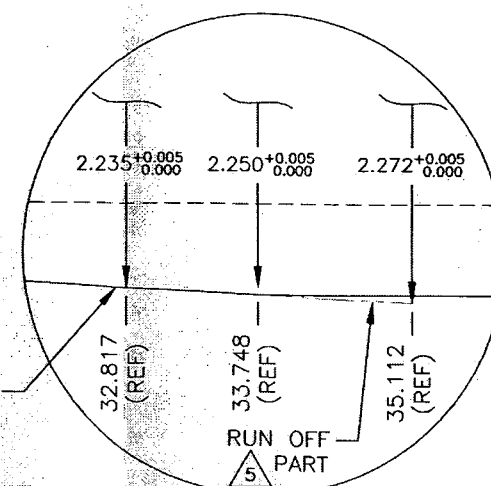
RELEASED
00.11.24

DETAIL A: CROSSTUBE CUFF



DETAIL B:
CUFF TRANSITION
SCALE 4:1

DETAIL C:
TAPER RUN-OFF
NOT TO SCALE



UNDER REVIEW

06.10.04 RH
update view B-D
07.01.09
RH

NO. 30219
WORK ORDER
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		DATE	00.11.17			TITLE	CROSSTUBE ASSEMBLY (CH-53 HIGH PWR)
						SCALE	1:1

REV. A
SHEET 3 OF 3

DART AEROSPACE LTD		Work Order:
Description: Crosstube Assembly		Part Number: D058676101
Inspection Dwg: D058676101 Rev: A		Page 1 of 1

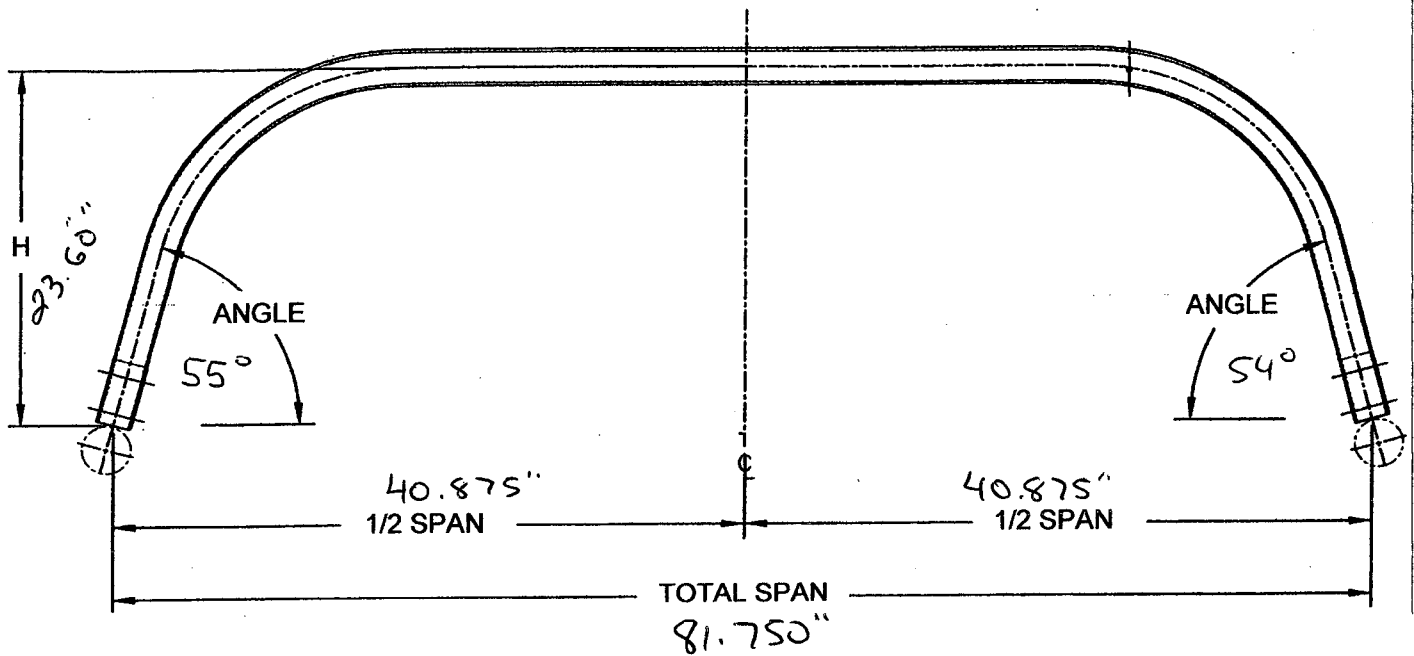
FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

Inspection Sheet	Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005 -0.000	2.242	✓			
	2.069	"	2.071	✓			
	2.113	"	2.114	✓			
	2.158	"	2.160	✓			
	2.183	"	2.185	✓			
	2.209	"	2.211	✓			
	2.235	"	2.237	✓			
	2.207	±.001	2.207	✓			
	R.063	±.010	.063	✓			
	R.500	"	.500	✓			
SIDE B	2.240	+0.005 -0.000	2.242	✓			
	2.069	"	2.071	✓			
	2.113	"	2.115	✓			
	2.158	"	2.160	✓			
	2.183	"	2.185	✓			
	2.209	"	2.211	✓			
	2.235	"	2.237	✓			
	2.207	±.001	2.207	✓			
	R.063	±.010	.063	✓			
	R.500	"	.500	✓			
	103.03	±.020	103.03	✓			

Measured by: MS	Audited by: EP	Prototype Approval:	N/A
Date: 07/01/15	Date: 07/01/15	Date:	N/A
Rev A	Date	Change New Issue	Revised by KJ/JLM
			Approved

Crosstube Bend Dimension Sheet



PART NUMBER: 1058-676-101

BATCH NUMBER: 30219

DRAWING: 1058 676 14 / REVISION: A

H: 23.58

1/2 SPAN: 40.92

TOTAL SPAN: 81.84

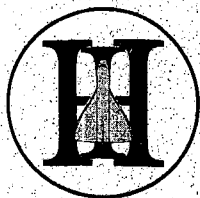
ANGLE: 54

QC 15: AA

DATE: 07/02/05

QTY: 1

Fit in table jig



HeathAir

INTERNATIONAL (1991) INC.

681 Ave. Lepine, Dorval, Québec H9P 1G3
Tél.: (514) 636-1000 • Fax: (514) 636-0031

W.O. N° 35932

A.M.O. Number: 46/90

NON-DESTRUCTIVE TESTING REPORT

AIRCRAFT / COMPONENT INFORMATION

REGISTRATION:

MODEL/TYPE:

SERIAL NUMBER:

TOTAL HR/LDG:

OPERATED BY:

BASED AT:

INSPECTION REQUIREMENTS

Carry out FPI of (6) cross tubes (external surface) as per ASTM E-1417-05 and the Dart QSI 038, Section 4.1.1 (on file at client) - parts delivered to HeathAir.

Qty (6) P/N D058-676-101 S/N's B30218, B30217, B30219, B28767, B28763 and B30216.

☐ RADIOGRAPHY

☐ ULTRASONIC

☒ PENETRANT

☐ MAGNETIC PARTICLE

☐ EDDY CURRENT

INSPECTION REPORT

Fluorescent penetrant inspection was performed in accordance with the above requirements on (6) cross tubes.

Note: A Level 3 penetrant was substituted for the requested Level 2 (3 is more sensitive)
Ardrox 970P25E Batch #04B503.

(6) cross tubes inspected. (6) PASSED / (0) FAILED.

THE MAINTENANCE DESCRIBED ABOVE HAS BEEN PERFORMED IN ACCORDANCE WITH
THE APPLICABLE STANDARDS OF AIRWORTHINESS

INSPECTED BY:

DATE March 09, 2007

INSPECTION
STAMP(S)

CUSTOMER INFORMATION

CUSTOMER: Dart Aerospace

P.O. NUMBER PO-00003270

ADDRESS:

CONTACT NAME: Linda Lacelle

LABOUR

@

\$

MATERIALS

@

TRAVEL EXPENSES

@

GST

HOTEL EXPENSES

@

PST

INVOICE NO.

TOTAL \$

WHITE COPY - INSPECTION FILE • YELLOW COPY - CUSTOMER • PINK COPY - ACCOUNTANT